



iNEMI

International Electronics Manufacturing Initiative

iNEMI
Functional
Test Coverage
Assessment
Project

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APEX
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Advancing manufacturing technology

Agenda

- **Overview of iNEMI, mission and project life cycle: Dave Godlewski, 10 min**
- **Review effort to date and Statement of Work, 15 min**
- **Review potential uses for functional test coverage assessments, 30 min**
 - **Examples: Ryan Kinney, Tony Taylor**
- **Discuss Phase 1, Definitions and Usage Models, 20 min**
 - **Review potential uses for FT coverage assessments**
 - **What terms of methods need to be defined?**
 - **Capture new usage models: what data is required? What decisions will be made?**
 - **What spectrum of test and manufacturing is represented by participants? What perspectives are not represented and how do we get input: recruit or establish a communication path?**
- **Generally discuss Phase 2 and Phase 3, 10 min**
 - **What tools might support the usage models?**
 - **First pass estimate of effort to implement these tools**
 - **Set up conference call schedule and discuss another face-to-face, potentially at SMTIA**
- **Opens and wrap-up, 5 min**

Overview of iNEMI, Mission and Project Life Cycle



Effort to Date and Statement of Work Review

- **What has been done so far...**
 - **Proposed Functional Test Coverage Project under iNEMI Board Assembly Group**
 - **Drafted Scope of Work and three phases of the project**
 - **Solicited participation in the project and held two conference calls to collect input on the project scope**
 - **Review SOW doc**



Microsoft Word
Document

Potential Uses for Functional Test Coverage Assessments

Sub-Technology	Module	Subtest	Covered?	
1394a	1394	1394 Presence	✓	100%
		1394 EUI Check	✓	
USB 1.x	USB	USB Destructive WRC	✓	100%
		USB UHCI Presence	✓	
		USB EHCI Presence	✓	
USB 2.x				
3-pin Fan		Verify Fan Presence	✓	
4-pin Fan		Verify Fan Presence Verify Fan Speed Control	✓	
5-pin			✓	
8-pin				75%

Key Output: Sub-technology coverage, Overall Coverage
Key Decisions: Is FT coverage sufficient – on a sub-technology level and on a global level? For known gaps upstream, is the technology covered at FT?

Discuss Phase 1, Definitions

- **Definitions**
 - **Structural defect spectrum and functional defect spectrum**
 - PCOLA/SOQ
 - MPS
 - PPVS
 - **Means of assessment**
 - Inspection
 - Observation
 - Validation
 - **Functional Block**
 - Aggregate of (potentially) circuitry, FW and SW to perform a labeled function
 - **Feature**
 - Sub-function of circuitry, FW or SW
 - **At-speed**
 - All critical speeds, including lowest, middle or highest speeds
 - **Patterns and relation to coverage**
 - Is coverage dependent on the type of patterns used?
 - **System stress**
 - **Diagnosability**

Discuss Phase 1, Usage Models

- **What critical decisions must be made?**
- **What data is required for critical test decisions?**
- **Examples:**
 - **Meeting quality requirements, e.g., ...**
 - **X% coverage of all functional blocks**
 - **Y% coverage of all critical blocks**
 - **Full speed testing of all interfaces**
 - **Comparing of test revisions**
 - **Comparing test environments**
 - **Comparing test stage coverage**
 - **Leveraging previous coverage assessments of reused blocks**

Generally Discuss Phase 2 and Phase 3

- **Phase 2**
 - **Determine deliverables for Phase 3**
 - **Adopt structural defect spectrum**
 - **Expand defect spectrum to encompass functional test**
 - **Add scoring elements, such as:**
 - **Assessment means**
 - **Inspection, Observation, Validation**
 - **Confidence margin**
 - **Tested at all speed ranges? Are all possible shorts detected? How far out of tolerance can the resistor be before a failure results? Scale the score to accommodate confidence in the score.**
 - **Create scoring guidelines**
 - **When do you assign a coverage parameter a full score?**
 - **When do you derate the score? By how much?**



Microsoft Excel
Worksheet

INEMI

Generally Discuss Phase 2 and Phase 3

- **Phase 3**
 - **Create deliverables determined in Phase 2**
 - **Check deliverables against usage models from Phase 1 to ensure they**

Opens and Wrap-up



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